

## **The Economic Situation of Family-farm Enterprises in the Southern Black Forest**

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Changes in the economic environment, including increased international competition caused by globalisation, low-priced imports and high costs of labour, are influencing the economic situation of all agricultural enterprises, and naturally including those on forest land. As a result, changes are taking place in the structure of agricultural enterprises, with smaller units disappearing. Enterprises with greater areas of agricultural and forest land strive to expand by purchasing or leasing more agricultural area or forests, depending on their labour and financial resources. Another way to overcome the economic needs and to survive as a family enterprise in the future is to find new sources of income. In a case study in the Southern Black Forest an investigation of 32 family-enterprises with agricultural and forest land and members of an accounting network was carried out in order to register all types of income of the family which contribute economically to their costs of living. Besides the traditional income from agriculture and forestry, income was found to be derived from renting rooms or flats for holiday-makers, employment outside the enterprise, contract-working, and direct-marketing of own products. This paper presents the results of the study, showing the overall distribution of the total income of the family to the various types of activities of the family. On average, agriculture, forestry and the other income sources are found to each contribute about one third to overall income. The great variety of income combinations are illustrated in diagrams and clustered to different types of organization of family-farm enterprise. It is also notable that the amount of the total income varies from very high to very low between individual enterprises.

### **INTRODUCTION**

Statistics or reports on income of farms are concentrated either on the agricultural or on the forest sector, and rarely provide information on total income of family-farm enterprises. This information gap motivated a special investigation to collect data on all income-sources of farm-family enterprises in a specific region of the Black Forest. Mainly in mountainous areas, a network of farm-holdings is regarded as necessary to maintain an open and well-tended landscape for tourism purposes as well as wider social benefits. Therefore it is a problem of public interest to have

information about the economic situation of family-farm enterprises for example in the Black Forest and their possibilities to survive regarding different prospects of future developments. With more economic information about this group of enterprises it is possible to create, adapt or develop existing instruments of financial subsidies, of other incentive programs or of extension services.

The objectives of this research project were to obtain figures about the amount of the total income of family-farm enterprises on a regional level, and to obtain information about the different kinds of income sources and their contribution to the total income. The main impetus for the project has arisen from the political aspect of the information gap. With regard to the social implications of the continuing severe change in the structure of agricultural enterprises, it is of great interest to know how existing family-farm enterprises earn their income and how stable this situation is in the long run.

## THE REGION OF THE STATE OF BADEN-WÜRTTEMBERG

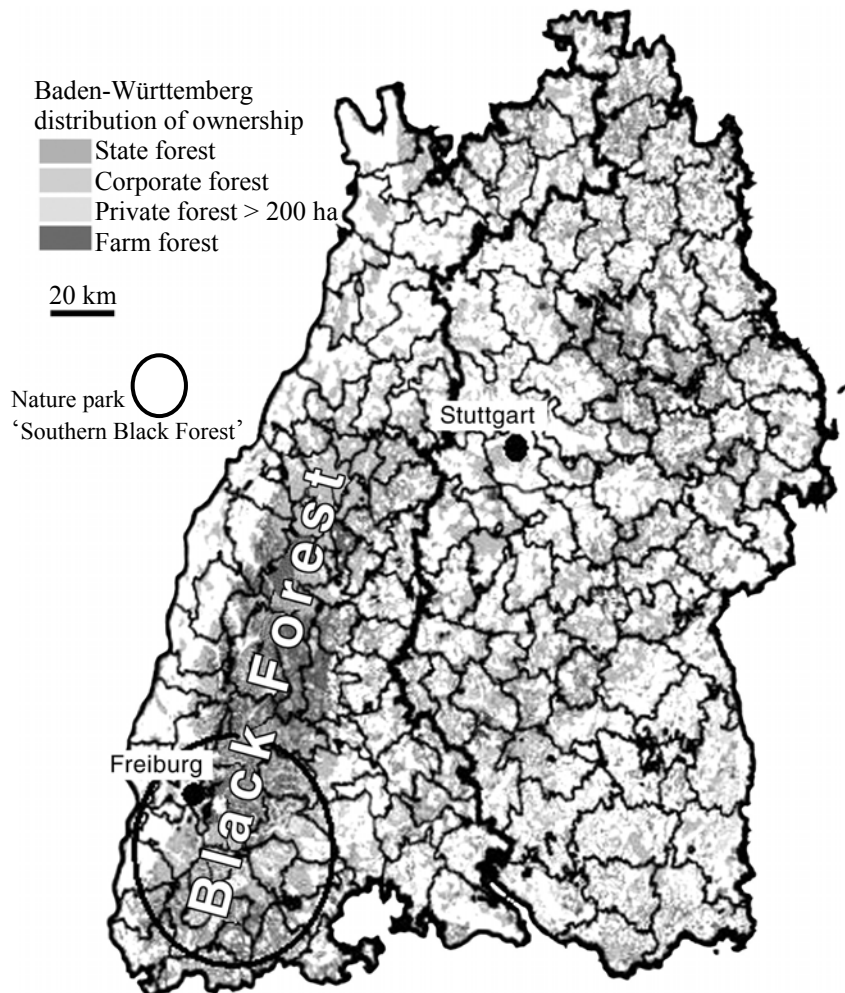
The state of Baden-Württemberg is a densely wooded area of the Federal Republic of Germany, with a forest cover of 38%. Forest resources are very high (about 500 M m<sup>3</sup> in total, 361 m<sup>3</sup>/ha), especially those of the privately owned forests that have a high percentage of conifers. The distribution of forest ownership is dominated by corporate (38% of the total forest area) and private forests (37%). Corporate forests are in the possession of municipalities, communities and churches. State forest is either owned by the federal state of Baden-Württemberg (about 24% of total forest area) or by the federal government of Germany (only 1%, thus of minor importance). Farmers own about 85% (130,000 ha) of the private forests with areas between five and 200 ha. The size distribution of private forests is indicated in Table 1.

**Table 1.** Structure of land use in private forests

Forest size	Total area (ha)	Fraction of forest land (%)	Number of enterprises
< 5 ha	167,000	33	About 153,000
5-200 ha	173,000	35	11,400
200-1000 ha	29,000	6	65
> 1000 ha	124,000	25	35
Private forest total	493,000	100	About 164,500

The Black Forest is a low mountain range in the south-west corner of Germany, situated in Baden-Württemberg. The mountains cover an area of 500,000 ha, running 160 km from north to south and 40–50 km from east to west. The highest elevation is nearly 1500 m. The whole area is an internationally known recreation-area, attractive in summer for hiking and in winter for all kinds of skiing. Hot springs are found at the western border near the Rhein Valley, and have been used for recreation since the time when the Roman Empire expanded into Germany and

Roman civilisation came over the Alps into the Rhein Valley. Famous spa resorts such as Baden-Baden and Badenweiler were founded by the Romans.



**Figure 1.** Nature park, 'Southern Black Forest'

At the time when the Romans had occupied and settled in parts of Germany, the mountain area of the Black Forest remained untouched. One thousand years later, beginning about 900 AD the mountains were opened up by settlements, and the forests cleared to obtain land for settlements and agriculture. However, even today the Black Forest is characterized by its dense forest cover.

The structure of settlement is characterized by so called 'Einzelhof-Siedlung', meaning detached farm houses, not together in a village but rather spread out over the landscape following a typical design of settlement along the rivers and creeks. Each farm holding has its entire land area around the farm house. The distance to the next holding is about 300 to 800 meters. These farm holdings do not only need land

for agriculture and cattle-feeding, but also a large amount of forest area, in order to be able to be financially viable. Hence they typically comprise farm holdings, which manage both agricultural areas – mostly grassland – and forest areas as farm-forests.

The density of the forests varies throughout regions of the Black Forest. In the middle and southern parts the conditions for farming, mainly determined by soil and climate, are better than in the north. As a consequence, there is more open landscape in the south, where the forests comprise 50–55% of the land, compared with 70–80% in the north. It is notable that in the Nature Park ‘Southern Black Forest’, there is a greater proportion of agricultural land compared with the situation in the entire Black Forest. If the structure of land-use in the whole Black Forest and the nature park ‘Southern Black Forest’ are compared, both similarities and differences are noted (Table 2).

**Table 2.** Structure of land use in the Black Forest and in the nature park

Structure of land use	Black Forest		Nature park ‘Southern Black Forest’	
	Area (ha)	Fraction (%)	Area (ha)	Fraction (%)
Forest land	327,000	65.4	184,000	57
Agricultural land	136,000	27.2	111,000	35
Settlement, traffic	31,300	6.3	23,500	7
Water	3,250	0.7	3,500	1
Other uses	1,790	0.4	–	–
Total land area	500,000	100.0	322,000	100

The distribution of the forests in the Nature Park among the usual ownership categories indicates a dominance of private forests (44% or 141,700 ha). Smaller areas exist of corporate forests (36% or 115,900 ha) and state forest (20% or 64,400 ha). Among the private forests the forest area category 5–200 ha forest area per owner dominates with 55%, followed by very small units of 0–5 ha (30%) then large forest holdings with more than 200 ha (15%).

## METHODOLOGICAL ASPECTS

Obtaining reliable data on the economic situation of farm forestry enterprises presents considerable difficulty, and in Europe a large amount of research has been carried out to define appropriate methods for estimating the economic performance of farm forestry enterprises (e.g. Niskanen and Hyttinen 1999, Niskanen and Sekot 2001). These reports provide substantial information about advantages and disadvantages of the various data collection methodologies.

The creation and running of an accountancy network is often used for long-term monitoring of the economic situation of farm forestry. In the state of Baden-Württemberg such a network has existed for more than 20 years, and various publications on results and experiences are available (e.g. Brandl and Nain 1999,

Brandl *et al.* 1999). The creation and running of such a network had been justified by the information needs and the demonstrated advantages of this approach:

- The running network proves that in the long run the participating forest owners have learned to manage their forests in a better and more effective way.
- The function of multipliers of information to other woodlots owners can be found.
- The forest owners associations use the data in a variety of ways.
- Forest advisory and extension organisations could base their work in relation to economic questions on these results and the additional information.
- Policy makers and the state administration have used the data to decide the amount of special financial subsidy for woodland owners in Baden-Württemberg.
- The data generated by the running network proved valuable for a substantial amount of secondary research.

In connection with such a running network, many questions on accuracy, validity, reliability and representation had to be solved. A European Research Project has concentrated on such problems, and as a result it was possible to publish 'Guidelines for Establishing Farm Forestry Accountancy Networks: MOSEFA' (Niskanen and Sekot 2001). At the time of designing and establishing the running network of Baden-Württemberg, not all of these requirements were met. In reality, the persons dealing with these problems had been confronted with a mixture of positive and negative conditions and aspects which had to be taken into account. These aspects have included the following (from Brandl and Nain 1999):

- a) The whole population for the survey is known very well by number of enterprise units, by the area owned and also in sub-units as size classes of the forest area, as described above, hence the conditions for stratification into typological sub-units have been sound. In the year 1995, the category of enterprises owning a forest area of five to 200 ha comprised the following:

Item	Number of farm enterprises owning forests	Number of forest enterprises	Total number of private enterprises
Number	8,467	2,966	11,433
Forest area (ha)	121,731 (38%)	51,360	173,091
Agricultural area (ha)	197,320 (62%)	784	198,104
Total area	319,051	52,144	371,195

The data generated from the sample network allow statements on approximately 173,000 ha forest area as well as for a regional association of enterprises which includes another 200,000 ha of agricultural area. Main sub-units can be defined by (1) differentiation into four regions, each of them containing a local typical concentration of farm forests, and (2) differentiation into four size-classes, namely 5-10 ha, 10-20 ha, 20-50 ha and 50-200 ha.

- b) Based on an earlier phase of the running network (1975-77) substantial information has been obtained about the variability of the main target variables. With this information it was possible to calculate the necessary number of farms in the total running network and also in the sub-units. The result of such calculations has been: the running network should contain at least 160 enterprises in total and at least 20 in each sub-unit. The distribution of the enterprises in the survey into the sub-units could be then carried out according to the distribution of the total population into these sub-units.
- c) One basic requirement for real random sampling or systematic sampling could not be fulfilled, namely that each person in the whole population can be chosen with the same probability. Participation is voluntary and therefore a selection by pure chance is not possible; it is not possible to compel anyone to participate. Another self-selection bias is that those respondents who are more interested in the performance of their business are more likely to agree to participate. Consequently, the sample would be biased towards better results in economic terms.
- d) The criteria for the quality (accuracy, validity and reliability) of observations for the running network can be evaluated. The standard errors and coefficients of variation for key variables are quite satisfactory (standard error less than 10%). All variables which are measured are operationally defined and documented. Data are collected by specialized staff with the assistance of the farmers. Data collection is also largely independent of individual characteristics. Therefore validity and reliability reach a high level.
- e) Membership of the sample has been relatively stable. The fluctuation in members of the running network during 20 years has been very low. The replacement rate has been relatively constant during this period at 2-3 farms per year. As a result, the constant part of the sample after 20 years contains 110 enterprises (63% of the total sample).

Other methodologies have also been applied to obtain economic information about farm forestry. An alternative which was taken into consideration and was also realised in earlier times in northern Germany (Westfalen-Lippe) was to develop models (Brandl and Nain 1999). The basis of one completed model was a census of the natural situation of all farms in this region, obtaining details of forest area, distribution of tree species and age classes, average standing volume and yield for 17,500 enterprises. All economic data were then derived from calculations and other statistical sources, mainly from other types of ownership, and added into the model. This approach was rejected in favour of the accountancy network for Baden-Württemberg, to obtain more direct information on economic activity and labour organisation on farms (Brandl and Nain 1999).

A severe information gap in this accountancy network in Baden-Württemberg is that only data from the forest and the activities in the forest are subject to the financial accounting. All other sources of the income of the family are neglected. The reason is that only with this restriction has it been possible to motivate enough owners of family-farm enterprises to take part in this project.

A major joint research project of the Forest Research Institute of Baden-Württemberg and the Faculty of Forestry of the University of Freiburg provided the opportunity for a special survey in farms which are participants in the accountancy

network. The aim was to investigate the total income of family-farm enterprises. In a sample of 32 holdings the different parts of income had been recorded by personal inquiries on the farms. Various sources of information have been used, including bookkeeping, other records, calculations and oral questioning. Because all farms are members in the forest network of test-farms in Baden-Württemberg, the data about forestry are of high quality. Also, in the agricultural sector, bookkeeping data could be used. Information about other kinds of income have been obtained directly from the owner and family members. In this way it was possible to identify the amount of the total income of each family and also the distribution into the different sources of income.

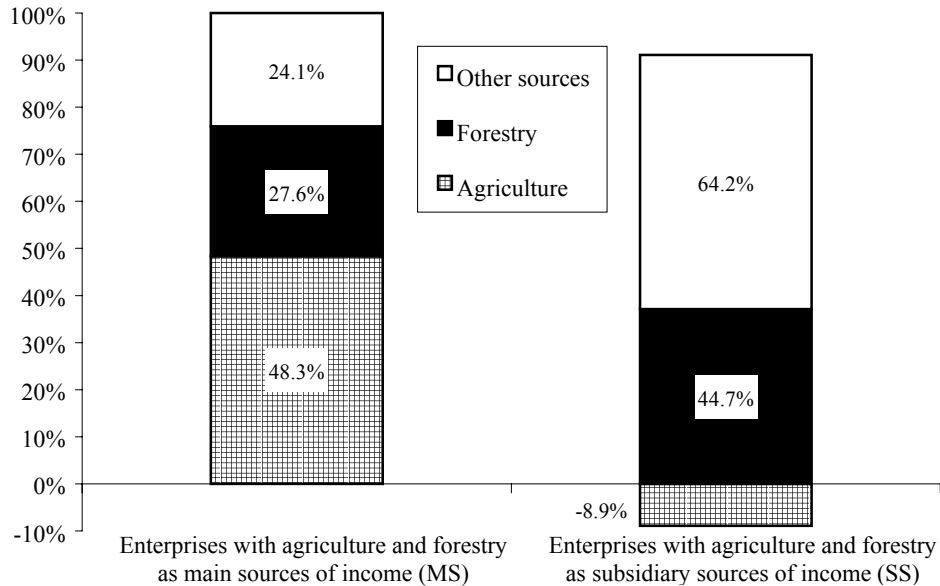
## RESULTS ABOUT INCOME AND THE SOURCES

The results of the analysis indicate a significant shift in the sources of farm income away from the traditional sources of agriculture and forestry. The contribution to total income of agriculture (35%) and forestry (29%) are less than that of other income sources (36%). These other sources include off-farm job opportunities (employed and self-employed), tourism or direct marketing of own products. These results are indicators for a great change in the traditional farming system in the Black Forest. For centuries, agriculture and forestry were the only sources of income to meet the needs of a family. When in earlier times – for example during the agrarian crisis in the second half of the 19<sup>th</sup> century – these two sources did not ensure the livelihood of the owners family, the normal reaction was to sell the farm and to move away, sometimes as an emigrant to far away far countries and continents. Now new solutions have been found to create new sources of income for the family and so to maintain the old property and also to subsidize sometimes the traditional branches. The approach has been to use existing resources. This could be the large farm-house, when unused rooms had been fitted out as flats and rooms for holiday-makers. Also, the labour capacity of the family has been used for other jobs, and the farming activities operated in a more extensive way with less labour input.

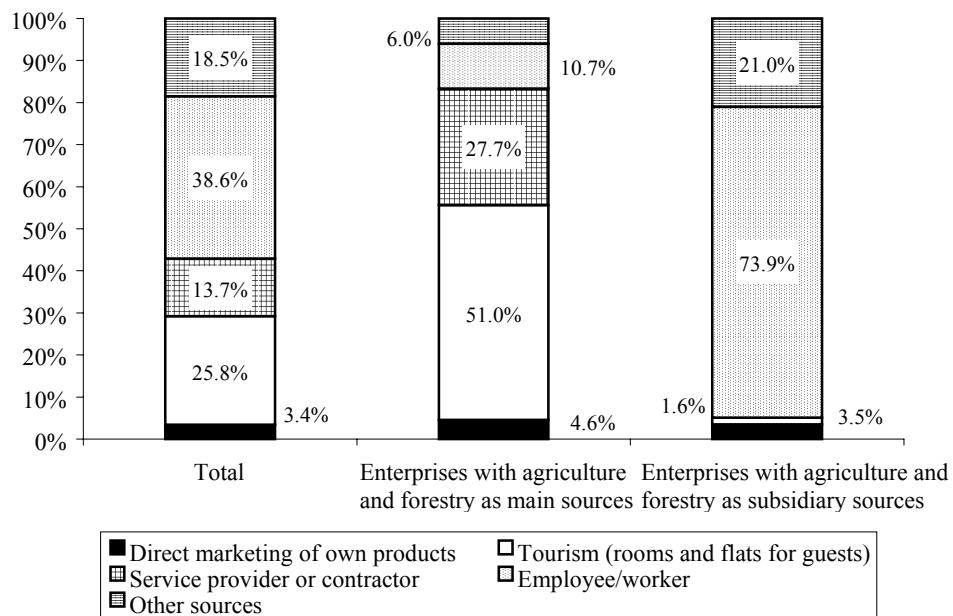
The change in major sources of income has consequences for the system of statistics on Agriculture and Forestry. A distinction has been made between enterprises with Agriculture and Forestry as main sources of income (MS), and enterprises where second occupations of members of the family or other income possibilities play the major role (enterprises with agriculture and forestry as subsidiary sources of income, SS). In the group of MS, agriculture is the dominant source of income (48.3%), followed by forestry (27.6%) then other sources (24.1%). This category represents the traditional type of family farms in the Black Forest, where agriculture and forestry play the main role. Structure and organization of the management of the farm are adapted to the special conditions of this type of farming (Figure 2).

In the SS enterprises where the other possibilities are dominant (64.2%), an unexpected finding is that agriculture is only maintained as a kind of hobby, because of the deficit shown in Figure 2, for which both other sources have to compensate. There is a variety of other sources of income. Dominant are jobs as an employee (38.6%). The second major source of other income is earnings through tourism (renting rooms or flats). In these cases the possibilities of the large farmhouses in the

Black Forest are advantageously used to gain additional income for the family. In the traditional farm holdings with agriculture and forestry as main income sources, tourism is the major source of other income (Figure 3).



**Figure 2.** Structure of income in two different types of enterprise



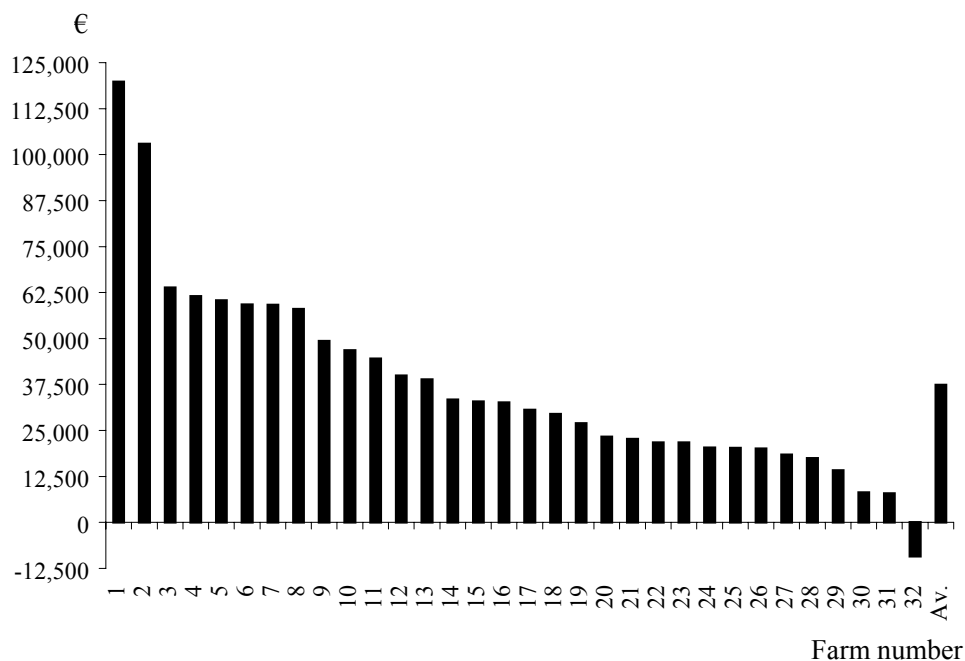
**Figure 3.** Distribution of other sources of income (i.e. excluding agriculture and forestry)



The third most important income source is income from self-employment as contractor, i.e. working with own machinery in other farm holdings or providing services for the village such as snow-clearing.

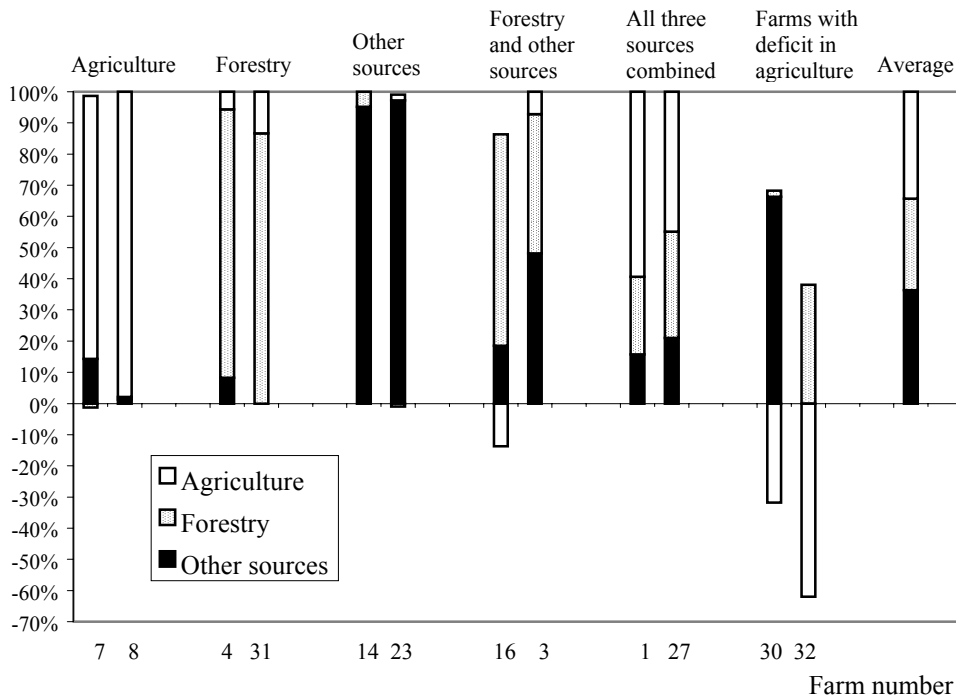
In enterprises with a second occupation as the main income source, jobs as employees are the most used possibilities. The direct marketing of own products (e.g. kirsch, honey, cheese and butter) play a very small role in this context. The remaining category 'Others' combines various possibilities such as income from rents or pensions.

Another surprising fact is the great difference between the enterprises with the highest and lowest income. On average the owner's family have a sufficient amount of income with about 38,000 EURO (€) per year (Figure 4). The total income as presented here consists of that from agriculture and forestry, and other sources such as tourism and direct marketing, and from off-farm work. The calculation of income takes account of all revenues, including subsidies, minus all costs except for family labour. At the highest level, incomes of single holdings exceed 100,000 €. At the other extreme are holdings which have negative income. The question that arises is, 'How can the family pay for their costs of living?' The explanation is that within the total costs of the enterprise there are imputed costs such as depreciation and some other calculated flat rates. All these costs do not necessarily reduce the liquidity of the enterprise, the family being able to finance their living costs by running down the capital base of the enterprise. Naturally those enterprises are in a critical situation in the long run, because there is no reserve to renew old machinery, to repair the house and to provide money for other necessary investments.



**Figure 4.** Family-farm enterprises in Southern Black Forest: total income of each farm

While the variation in income is great, the average income of 28,000 € is closely comparable with the income of a standardized so-called '4-persons-household of employees and workers with middle income' (in distinction to households of civil servants and employees with higher income). These households have about 32,000 to 40,000 € at their disposal. Also the variation of the income combination from all three sources is very high in this group. It is notable that each farm-holding has found its own combination among the given possibilities. Information about the distinct types of income distributions on farms is one of the significant results of this survey (Figure 5). When the enterprises are selected by different types of income-combination, all possible combinations can be seen: enterprises depending only on agriculture, or only on forestry, or depending on two sources or combining all three sources. The type representing the average can also be found, but the number of such enterprises is not higher than in the other types. Also, farm types can be identified where income from forestry and other sources compensate an income deficit from agriculture.



**Figure 5.** Structure of the income in different single farms

## DISCUSSION

In mountainous regions such as the Black Forest, family-farm enterprises have traditionally earned their living from agriculture (mainly milk production and cattle breeding) and forestry. After the Second World War a slow but long-term downward trend in real prices for agricultural products and for timber commenced. It became

obvious that managing a family-farm enterprise in the traditional way could not provide the livelihood of the family in the long term. This presented landholders with the option of giving up farming and the farm and seeking other jobs or professions, or alternatively creating other sources of income in combination with the management of the existing farm enterprise. The development within the last 40 years shows that both possibilities had been realized. The remaining farms absorbed the agricultural areas of the farms given up (though not the forests!) and enlarged their production capacity. But at the same time they started initiatives to earn additional income from other sources.

A survey of members of a farm accountancy network has revealed that these other sources show a great variety of possibilities, but five kinds of income source are particularly notable. The most important is working as employees or as a self-employed contractor or service provider. The second important source is the modification of farm-houses by converting normal rooms into separate flats for rental to tourists.

No typical combination or standardization of income sources has taken place. Individual preferences, special know-how or connections had been decisive. Each enterprise has found its own combination from the different opportunities which can be realized. The farm of nowadays is an enterprise which offers a variety of products for the market. Therefore it is impossible to draw up the picture of a 'typical farm-forest-enterprise' in the Black Forest as a result of this survey.

The survey shows that in spite of the relatively high average income there exists a large group of farm forest enterprises which suffer from a low income problem. The continuing existence of such farms is tenuous, and in the long term there is little chance that they will survive. Over decades, systems of incentives and subsidies for agriculture and for forestry had been built up, and it is necessary that these systems are maintained in the future. The findings of this research project provide important guidance on how to maintain and to extend these types of incentives, for policy decision-makers and for administrative purposes. Given the wide variety of solutions adopted by individual farm holdings, a combination of different types of support systems by the state administration, such as financial subsidies, technical help with better mechanized harvesting systems and personal assistance by the state forest service can help these holdings to ensure their livelihood in the long term.

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